

LISTING OF THE CLAIMS:

This listing of claims replaces all prior versions, and listings, of claims in the application:

- 1 1. (Withdrawn) A system comprising:
 - 2 a source of substantially spin-polarized electrons; and
 - 3 a medium which interacts with the spin-polarized electrons, the medium including a spin-
 - 4 dependent quantum well and a layer of semi-conductor material capable of emitting photons.

- 1 2. (Withdrawn) The system of claim 1, wherein the layer of semi-conductor material comprises
 - 2 a layer of N-type semi-conductor and a layer of P-type semi-conductor coupled so as to form a
 - 3 P-N junction.

- 1 3. (Withdrawn) The system of claim 2, wherein the P-N junction comprises an electron excited
 - 2 light emitting structure.

- 1 4. (Withdrawn) The system of claim 3, wherein the layer of semi-conductor material comprises
 - 2 Gallium-Arsenic (GaAs).

- 1 5. (Withdrawn) The system of claim 4, wherein the spin-dependent quantum well is
 - 2 substantially opaque to the photons emitted, during operation, by the layer of semi-conductor
 - 3 material.

- 1 6. (Withdrawn) The system of claim 1, wherein the spin-dependent quantum well comprises a
 - 2 layer of layer of magnetic material sandwiched between a first and second layers of spin mirror
 - 3 materials.

1 7. (Withdrawn) The system of claim 6, further including:
2 a first layer of a electrically conductive material between the first layer of spin mirror
3 material and the layer of hard magnetic material; and,
4 a second layer of electrically conductive material below the layer of semi-conductor
5 material.

1 8. (Withdrawn) The system of claim 7, wherein the second layer of electrically conductive
2 material is substantially thin to allow photons emitted, during operation, by the layer of semi-
3 conductor material to pass through the second layer of electrically conductive material.

1 9. (Withdrawn) The system of claim 7, wherein the second layer of electrically conductive
2 material, at least partially, reflects the photons emitted, during operation, by the semi-conductor
3 material.

1 10. (Withdrawn) A method for reading the spin state of a magnetic domain comprising:
2 directing at the magnetic domain a beam of electrons substantially polarized in a
3 particular spin state; and
4 detecting the light emission state of a semi-conductor layer of the magnetic domain.

1 11. (Withdrawn) The method of claim 10, wherein detecting the light emission state comprises
2 capturing at least a portion of the emitted photons utilizing a sensitive photo-detector.

1 12. (Withdrawn) The method of claim 10, further comprising determining the state of the
2 magnetic domain, based in, part upon the light emission state.

1 13. (Withdrawn) The method of claim 12, wherein determining the state of the magnetic
2 domain comprises comparing the spin state of the beam of electrons to the light emission state of
3 the semi-conductor layer.

1 14. (Withdrawn) The method of claim 12, further comprising trapping a portion of the beam in
2 the magnetic domain.

1 15. (Withdrawn) The method of claim 14, wherein determining the state of the magnetic
2 domain comprises determining what the state of the magnetic domain was prior to trapping a
3 portion of the beam in the magnetic domain.

1 16. A system for reading data comprising:
2 a source of spin polarized electrons;
3 a storage medium disposed a selected distance from the source and having a plurality of
4 storage locations, each storage location including a magnetic material and a layer of semi-
5 conductor material capable of emitting photons; and
6 a photo-detector to detect the emitted photons.

1 17. The system of claim 16, wherein the magnetic material of the storage location includes a
2 spin-dependent quantum well.

1 18. The system of claim 16, wherein the layer semi-conductor material of the storage location
2 includes a P-N junction.

1 19. The system of claim 16, wherein the layer semi-conductor material of the storage location
2 includes Gallium-Arsenic (GaAs).

1 20: The system of claim 16, further comprising a vacuum housing.

1 21: The system of claim 20, wherein the vacuum housing is at least partially reflective, so as to
2 facilitate the integration of the emitted photons.

1 22: The system of claim 16, wherein the magnetic material of the storage location is
2 substantially opaque to the photons emitted, during operation, by the layer of semi-conductor
3 material.

23 - 30. (Cancelled).